1989

Chemical Weed Control in Soybeans : 1989

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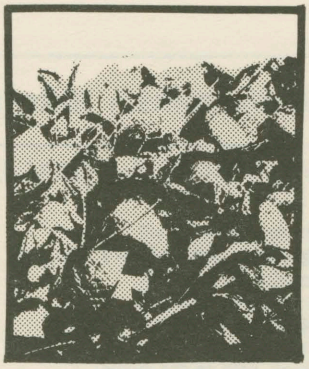

FS 525B

Weed Control in Soybeans: 1989

Cooperative Extension Service • South Dakota State University • U.S. Department of Agriculture

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Losses from weeds in soybeans can be serious. Annual broadleaves such as sunflower, velvetleaf, or cocklebur are difficult to control. Most perennial weeds cannot be controlled.

Herbicides are an aid to a good rotation, proper seedbed preparation, and cultivation.

Herbicide Suggestions

Information in this publication is based on South Dakota Agricultural Experiment Station research and other research or observations. Herbicides are included only after the chemical is registered by the Environmental Protection Agency (EPA) as to residue tolerances in crops used for food or feed.

There is no intent to specify product performance guarantees; such agreements involve the labeler and user. Consult specific labels and their accompanying material. Users are responsible for following all label directions and precautions.

Weed Problems. Weeds are grouped as small-seeded annual broadleaves (kochia, lambsquarters, pigweed, etc.), or perennial weeds. Control is rated poor, fair, good, very good, or excellent for each category of weeds.

Special Weed Problems. A section for "Special Weed Problems" gives the best treatments for each weed.

Herbicides. Most herbicides are listed by tradename. The common name is also included in the heading in parentheses. Only the common name is used when the same active ingredient is available in several products.

Treatments listed under "Soybean Herbicides" are those considered to the useful for most situations in South Dakota. Those listed under "Other Soybean Herbicides" may be useful for special problems, are inadequately tested, or have given less than consistent performance.

Rates. Rates for each treatment are stated as the amount of product per acre. All rates are on a broadcast basis; adjust accordingly for band application. Labeled rates for the range in soil types are listed in this publication. Suggested rates based on SDSU tests are also stated. These rates have provided acceptable weed control with at least one cultivation. Higher rates increase cost per acre, but may be justified where heavy weed pressure is expected or where maximum control is desired.

Cost. The cost per acre for each treatment is based on average prices for the previous season or current season price information if available. The cost for low and high rates is listed. Prices vary. Consult your dealer for actual price.

Time To Apply.
EARLY PREPLANT: Surface applications usually 2 to 6 weeks before planting in no-till systems.
PREPLANT INCORPORATED: Before the crop is planted, incorporate as directed.
SHALLOW PREPLANT INCORPORATED: Preplant incorporated, but herbicide is usually restricted to the top 1 to 2 inches of soil with single-pass incorporation.
PREEMERGENCE: After planting, but before crop or weeds emerge.
POSTEMERGENCE: After the crop or weeds have emerged.

Band vs. Broadcast

One cultivation is usually needed with broadcast applications. Banding reduces the cost per acre and usually replaces one or two row cultivations.

Adjust broadcast rates for banding. A 12- to 14-inch band is suggested for top planting; a 7-inch band is suggested for most deep furrow or lister planted crops.

Drilled or Solid Seeding

Drill-planted or solid-seeded soybeans are more competitive with weeds after the first 3 to 4 weeks.

Early season control is critical. Preplant or preemergence combinations are strongly suggested where both annual grasses and broadleaves are present.

Do not use these planting systems if perennials are a problem. Use the maximum herbicide rate for the soil type.

Reduced Tillage Systems Furrow and Top-Plant

Crop residue on the surface may distort the spray pattern or intercept some of the herbicide.

Using the maximum rate for the soil type will partially compensate; however, the amount used should not exceed labeled rates. Heavy residue should be worked into the soil before broadcasting soil-applied treatments. Devices to move residue from the row area will improve results for band application.

Do not use preplant incorporated treatments with deep furrow or lister planting, as treated soil is moved from the row area. For these systems, limit band width of preemergence herbicides to the width of the furrow bottom. Check herbicide label for restrictions on furrow planted crops.

Abbreviations Used

pt	= pint
qt	= quart
gal	= gallon
lb	= pound
W	= wettable powder
G	= granule
L	= liquid or emulsifiable concentrate
MT	= micro tech encapsulated
DF,DS	= dry flowable, dry spray
and/+	= split application (and) or tank-mix (+)
act	= actual, active or acid equivalent

Treflan or Trifluralin (TRIFLURALIN) ($3.35-6.70)

1-2 pt Treflan or Trifluralin 4L or .8-1.6 pt Treflan Pro 5E or 5-10 lb Treflan 10G (.5-1 lb act)

Excellent control of most annual grasses and fair control of small-seeded annual broadleaves such as pigweed and lambsquarters. Does not control mustard, nightshade, smartweed, or large-seeded annual broadleaves. Consistent performance. Very good crop tolerance. Low rate is for light, low organic matter soil; the high rate is for heavy, clay soil. Rate of 1.5 pt/A has been satisfactory in most SDSU tests. Liquid formulation may be applied in liquid fertilizer or may be impregnated onto certain dry fertilizers. Minimum carrier is 5 gpa for ground or air. Carryover may damage oats or sorghum planted the following year. Trifluralin (active ingredient in Treflan) now is available in other tradename products.

Liquid or granule formulation may be applied in late fall and incorporated with one fall tillage operation and one pass in the spring before planting. Spring application seems best suited for most soybean situations. Liquids usually preferred for spring application. Granules appear to fit best for fall applications. Limited data or experience with fall applications in soybeans; however, weed control with fall applied granules has been equal to that for spring applied liquid.

PREPLANT INCORPORATED. Spring application. Immediate incorporation preferred, but may be delayed up to 24 hours if soil surface is dry and wind is under 10 mph. Incorporate into the top 2 to 3 inches of soil using a tandem disk with small blades set to cut 4 to 6 inches deep operated at 4 to 6 mph, a field cultivator equipped with three or four rows of sweeps spaced no more than 7 inches apart, or other suitable equipment. A second incorporation improves uniformity, especially under wet, lumpy, or trashy conditions. Follow with a harrow or leveling device. A tandem disk followed by a field cultivator provides good incorporation under a variety of conditions. Improper incorporation reduces control.

Prowl (PENDIMETHALIN) ($3.20-9.55)

1-3 pt Prowl 4L (.5-1.5 lb act)

Excellent control of most annual grasses and fair control of small-seeded annual broadleaves such as pigweed and lambsquarters. Does not control mustard, nightshade, smartweed, or large-seeded annual broadleaves. Consistent performance as a preplant incorporated treatment. Very good crop tolerance if properly incorporated; less tolerance if left on the surface. Lower rates are for light, low organic matter soil; the higher rates are for heavy, clay soil. Rate of 2.5 pt/A has been satisfactory in most SDSU tests. Preplant incorporated applications may be made in liquid fertilizer or impregnated onto certain dry fertilizers. Minimum carrier is 10 gpa for ground or 5 gpa for air. No label restrictions for crops planted the following year. Problems have not been observed under normal conditions.

PREPLANT INCORPORATED. Immediate incorporation preferred, but may be delayed up to 7 days. Incorporate into the top 1 to 2 inches of soil with a small-bladed tandem disk set to cut 2 to 4 inches deep, field cultivator, or other suitable equipment. A second incorporation improves uniformity, especially if no rain was received or under lumpy, trashy conditions. Double pass incorporation required when using a disk of field cultivator. Follow with a harrow or leveling device. Improper incorporation reduces control.

Sonalan (ETHALFLURALIN) ($4.80-11.15)

1.5-3.5 pt Sonalan 3L (.66-1.33 lb act)

Excellent control of most annual grasses; fair to good control of small-seed annual broadleaves such as pigweed and lambsquarters. Does not give satisfactory control of mustard, smartweed, or large-seeded annual broadleaves. Consistent performance. Good crop tolerance in most situations. Performance has been similar to Treflan when amounts of product are adjusted to label rates. High rates provide eastern black nightshade suppression and give some added broadleaf control. Rate of 2.5 pt/A has been satisfactory in most SDSU tests. Use 3 to 3.5 pt/A and incorporate with two passes for partial nightshade control. May be applied in liquid fertilizer or impregnated on certain dry fertilizers. Minimum carrier is 5 gpa. Less soil residual than Treflan; no labeled limitations for common crops the following year.

PREPLANT INCORPORATED. Apply within 3 weeks before planting. Incorporate into top 2 to 3 inches of soil. Immediate incorporation preferred; however, incorporation may be delayed up to 48 hours. Use suitable equipment to provide uniform mixing. Second incorporation improves uniformity in the treated soil layer.

Vernam (VERNOLATE) or Reward (VERNOLATE + EXTENDER)

($7.20-11.25)

2.33-3.5 pt Vernam 7E or 2.66-4 pt Reward 6E (2-3 lb act)

Results on velvetleaf have been variable; control has been fair in some tests. Vernam and Reward have provided similar annual weed control in limited SDSU comparisons when compared at equal rates of active ingredient. Fair to good crop tolerance; soybeans outgrow initial emergence delay and leaf malformation. Reward contains the same active ingredient as Vernam plus a chemical extender to lengthen soil residual. This could improve seasonal weed control, especially for early applications. Low rate is for light, low organic matter soil. Rate of 3 pt/A Vernam or 3.5 pt/A Reward has been used in most SDSU tests.

PREPLANT INCORPORATED. Must be incorporated immediately. Incorporate into top 2 to 3 inches of soil with a small-bladed tandem disk set to cut 4 to 6 inches deep followed by a harrow or leveling device. A second incorporation insures uniformity. Improper incorporation reduces control.

Treflan and/+ Sencor or Lexone (TRIFLURALIN AND/+ METRIBUZIN)
Salute

Prowl and/+ Sencor or Lexone (PENDIMETHALIN AND/+ METRIBUZIN)
Sonalan and/+ Sencor or Lexone (ETHALFLURALIN AND/+ METRIBUZIN)

1-2 pt Treflan 4L and/+ .5-1 pt Sencor or Lexone 4L or .33-.66 lb Sencor or Lexone 75DF (.5-1 and/+ .25-.5 lb act) ($10.05-20.05)
1.5-3 pt Salute

1-2.5 pt Prowl 4L and/+ .5-1 pt Sencor or Lexone 4L or .33-.66 lb Sencor or Lexone 75DF (.5-1.25 and/+ .25-.5 lb act) ($9.85-21.30)
1.25-3 pt Sonalan 3L and/+ .5-1 pt Sencor or Lexone 4L or .33-.66 lb Sencor or Lexone 75DF .5-1.12 and/+ .25-.5 lb act) ($10.65-22.90)

Excellent control of several annual grasses and small-seeded annual broadleaves. Fair to good control of some large-seeded annual broadleaves. Of the soil applied treatments, metribuzin gives best annual broadleaved control. Fair crop tolerance. Risk of injury from metribuzin on variable, sandy, high pH, low organic matter soils or on clay knolls. Do not use on soil that is sandy, has a pH over 7.4, or less than 1% organic matter. Cold, wet soil conditions that slow crop emergence increase risk of injury. Combined effects of metribuzin with atrazine carryover can produce serious crop injury. Some soybean varieties are more sensitive to metribuzin. Use lower rates for light, lower organic matter soils. Higher rates are for heavy, clay, low pH soils.

Special labeling for Sencor + Treflan on calcareous soil provides for the use of Sencor at .33 to .5 lb 75DF or .5 to .75 pt 4L per acre for wild mustard, lambsquarters, and pigweed, including the use of .33 lb 75DF or .5 pt 4L per acre regardless of soil pH.

Salute 4E is a premix containing 2.66 lb trifluralin (Treflan) + 1.33 lb metribuzin (Sencor) active per gallon. Salute 4E at 2.25 pt/A is equivalent to 1.5 pt Treflan 4L + .75 pt Sencor 4L. It may be applied preplant incorporated or as a split preplant incorporated and preemergence treatment with additional Sencor applied preemergence following preplant incorporated Salute.

PREPLANT INCORPORATED. Tank-mix. Incorporate as for Treflan or Prowl or Sonalan alone. Best performance if rainfall very limited, but may give slightly less control of large-seeded annual broadleaves and have slightly less crop tolerance than split overlay application. Maximum metribuzin rate is .38 lb/A active for most soils. Rates of 1.5 pt Treflan 4L or 2.5 pt Prowl 4L or 2.5 pt Sonalan 3L + Sencor or Lexone at .75 pt of 4L or .5 lb of 75DF formulation per acre have been satisfactory in most SDSU tests. More convenient than split overlay application and good choice for small-seeded broadleaves.

SPLIT PREPLANT INCORPORATED AND PREEMERGENCE. Apply usual rate of Treflan or Prowl or Sonalan preplant and incorporate as for each herbicide used alone. Apply Sencor or Lexone preemergence after planting. Maximum Sencor or Lexone rate is .75 to 1 pt of 4L or .5 to .66 lb of 75DF formulation per acre. Slightly better crop tolerance than for preplant tank-mix but requires a second application.

SPLIT TANK-MIX PREPLANT INCORPORATED AND PREEMERGENCE. Incorporate a tank-mix of the usual rate of Treflan or Prowl with Sencor or Lexone as for the preplant incorporated treatment. Apply additional Sencor or Lexone preemergence after planting. Rates for the additional Sencor or Lexone for most soils are from .25 to .75 pt of 4L or .17 to .5 lb of 75DF formulation per acre. Rates of .5 pt or 4L or .33 lb of 75DF Sencor or Lexone formulation per acre have been used as the overlay in most SDSU tests. Provides better crop tolerance when higher Sencor or Lexone rates are needed for better control of weeds such as velvetleaf. Promising for special situations. Follow soil precautions carefully.

Treflan or Sonalan or Prowl and Lorox (TRIFLURALIN or ETHALFLURALIN or PENDIMETHALIN and LINURON)

1-2 pt Treflan 4L and .5-2 lb Lorox 50DF or .5-2 pt Lorox 4L (.5-1 and .25-1 lb act) ($6.90-20.90)
1.25-3 pt Sonalan 3L and 1-5 pt Lorox 4L (.5-1.12 and .5-2.5 lb act) ($11.05-44.95)
1-2.5 pt Prowl 4L and 1-2.5 lb Lorox 50DF or 1-2.5 pt Lorox 4L (.5-1.25 and .5-1.25 lb act) ($10.25-25.65)

Excellent control of annual grasses and very good control of several small-seeded annual broadleaves. Fair control of certain large-seeded broadleaves. Lorox rate of 2 lb of 50DF or 1 qt of 4L formulation per acre has been used in most SDSU tests. Low rates for lighter, low organic matter soil. Slightly less risk of injury than with metribuzin combinations. Plant seed 1.75 inches deep. Do not use on sands. Do not incorporate Lorox. Combined effects of Lorox with atrazine carryover can cause serious crop injury. Linuron (active ingredient in Lorox) now is available in other tradename products such as Linuron or Linex.

SPLIT PREPLANT INCORPORATED AND PREEMERGENCE. Incorporate usual rate of Treflan or Sonalan or Prowl before planting and apply Lorox preemergence. Follow application directions and precautions as for Treflan, Prowl, Sonalan, or Lorox used alone.

Treflan or Prowl or Sonalan and/+ Amiben (TRIFLURALIN or PENDIMETHALIN or ETHALFLURALIN and/+ CHLORAMBEN)

1.5-2 pt Treflan 4L and/+ 4-6 qt Amiben 1.8L or 2.4-3.6 lb Amiben 75DS (.75-1 and/+ 1.8-2.7 lb act) ($21.50-31.40)
1.5-2.5 pt Prowl 4L and/+ 4 qt Amiben 1.8L or 2.4 lb Amiben 75DS (.75-1.25 and/+ 1.8 lb act) ($21.20-24.40)
1.25-3 pt Sonalan 3L and/+ 4-6 qt Amiben 1.8L or 2.4-3.6 lb Amiben 75DS (.5-1.12 and/+ 1.8-2.7 lb act) ($20.40-34.20)

Excellent control of several annual grasses. Good to very good control of several small-seeded annual broadleaves such as Russian thistle, kochia, and lambsquarters. Fair control of several large-seeded annual broadleaves. Sonalan at high rate + Amiben provides fair to good nightshade control. Very good crop tolerance. Weed control and crop tolerance affected less by soil variation than for linuron or metribuzin. Minimum carrier is 10 gpa. Refer to sections for Treflan or Prowl or Amiben or Sonalan.

PREPLANT INCORPORATED. Tank-mix. Incorporate as for Treflan or Prowl or Sonalan alone. Shallow incorporation with Prowl preferred to deeper incorporation. Broadleaf control less than for split application except with extremely limited rainfall. Split application preferred for most situations.

SPLIT PREPLANT INCORPORATED AND PREEMERGENCE. Incorporate normal rate of Treflan or Prowl or Sonalan before planting and apply Amiben preemergence. Rainfall required for Amiben. Slightly better broadleaf control than preplant tank-mix. Preferred application method. Amiben may be banded to reduce cost.

Lasso (ALACHLOR)

2-3.5 qt Lasso 4L or 4MT or 16-26 lb Lasso II 15G (broadcast) (2-3.5 lb act) ($11.00-19.30)

Very good to excellent control of several annual grasses and fair control of pigweed with high rates and favorable conditions. Useful for special weed problems such as nightshade or nutsedge. Consistent on annual grasses when rainfall or soil moisture requirements are met. Excellent crop tolerance. Low rate is for light, low organic matter soil; the high rate is for heavy, clay soil. Rates of 2.5 to 3 qt Lasso or 18 to 20 Lasso II per acre (broadcast) have been satisfactory in most preemergence SDSU tests. Preplant spray or preemergence applications may be applied in liquid fertilizer. Preplant spray application may be impregnated onto certain dry fertilizers. Use 2.5 to 4 qt/A where soybeans are planted into high amounts of crop residue in minimum tillage systems. Minimum carrier is 10 gpa for ground or 3 gpa for air. Closed system handling required for treating acreages over 300. Lasso MT is a microencapsulated formulation containing 4 lb/gal. It has improved mixing qualities with fertilizer. Use and performance are similar to Lasso 4L. Granule or spray formulations appear equally effective. Granules are applied to the soil surface behind the press wheel. Adjust granule rate for banding. Follow handling directions. Use protective clothing including face shield, rubber gloves, and boots when mixing. No carryover. Restricted Use Pesticide.

SHALLOW PREPLANT INCORPORATED. Incorporate into top 2 inches of soil within 7 days of planting using a field cultivator, shallow disk, multiweeder, or other suitable equipment during final seedbed preparation. Flextine harrow is not satisfactory. Will improve control when rainfall is very limited but gives slightly less control than preemergence application with adequate rainfall. Some rainfall improves results. Proper incorporation may be difficult with trashy, lumpy seedbed. Deeper incorporation reduces annual grass control. Use 1 pt/A more Lasso than for preemergence. Rate of 3.5 qt/A Lasso has been used in most tests. Furrow planters will move treated soil from row area.

PREEMERGENCE. Requires 1/2 to 3/4 inch rainfall within one week after application. Use a harrow or rotary hoe if weeds emerge before rainfall is received. Travel the same direction as the rows if banded.

EARLY POSTEMERGENCE. Primarily for situations where unanticipated delays prevented preplant or preemergence application. Will not control emerged weeds. Apply before soybeans have more than two true leaves. Do not apply in liquid fertilizer.

Dual (METOLACHLOR)

1.5-3 pt Dual 8L or 6-12 lb Dual 25G (broadcast) (1.5-3 lb act) ($10.85-20.30)

Very good to excellent control of several grasses and fair control of pigweed with high rates and favorable conditions. Useful for special weed problems such as nightshade or nutsedge. Consistent on annual grasses when rainfall or soil moisture requirements are met. Excellent crop tolerance. Low rates are for light, low organic matter soil; the high rate is for heavy clay soil. Rates of 2.5 to 3 pt Dual or 10 to 12 lb Dual 25G (broadcast) have been satisfactory in most SDSU tests. Spray may be applied in liquid fertilizer. Preplant incorporated applications may be impregnated onto certain dry fertilizers. Minimum carrier is 10 gpa for ground and 2 gpa for air. Limited data on granule formulation. Adjust granule rate for band. Granules are applied to the soil surface behind the press wheel. No carryover.

EARLY PREPLANT SURFACE. Refer to Dual in No-Till section.

SHALLOW PREPLANT INCORPORATED. Incorporate into top 2 inches of soil with a field cultivator, shallow disk, or other suitable equipment during final seedbed preparation and within 14 days before planting. Will improve results when rainfall is very limited but gives slightly less control than preemergence application with adequate rainfall. Proper incorporation may be difficult with trashy, lumpy seedbed. Deeper incorporation reduces annual grass control. Use maximum rate for soil type.

PREEMERGENCE. Requires 1/2 to 3/4 inch rainfall within one week after application. Use a harrow or rotary hoe if weeds emerge before rainfall is received. Travel same direction as the rows if banded.

Amiben (CHLORAMBEN) ($16.45-24.65)

1-1.5 gal Amiben 1.8L or 2.4-3.6 lb Amiben 75DS or 20-30 lb Amiben 10G (broadcast) (1.8-2.7 lb act)

Good control of several annual grasses and good to very good control of some small-seeded annual broadleaves such as pigweed, lambsquarters, or smartweed. Very good Russian thistle control in some tests. Variable control of velvetleaf. Does not control sunflower. Some erratic results. Rainfall critical. Good crop tolerance. Some stunting noted with heavy rainfall at emergence. Spray or granule forms appear equally effective. Granules are applied to soil surface behind the press wheel. Low rate for light, low organic matter soil. Amiben rates of 6 qt or 3.6 lb of 75DS formulation per acre have been satisfactory in most SDSU tests. Preplant or preemergence applications may be made in liquid fertilizer carrier. Minimum carrier is 10 gpa for ground and 3 to 5 gpa for air.

SHALLOW PREPLANT INCORPORATED. Weed control less than for preemergence application except under extremely dry conditions. Incorporate before planting into the top 2 inches of soil with shallow disk or other suitable equipment.

PREEMERGENCE. Preferred application method. Must have 1/2-1 inch of rainfall within one week after application. Use rotary hoe or harrow if rainfall is not received within 3 to 5 days.

POSTEMERGENCE + CROP OIL. Apply when soybeans are in the cracking to fourth trifoliate stage. Use Amiben at 6 qt 1.8L or 3.6 lb 75DS plus 1 qt crop oil concentrate per acre. Rainfall required for residual control. Primarily for certain annual broadleaves. Small grasses may be controlled if moisture conditions are favorable. Results for other weeds improved with use of harrow or rotary hoe. Controls or suppresses 1- to 8-inch velvetleaf; 1- to 3-inch smartweed or pigweed. Primarily for special situations. Limited tests. Water carrier only. Do not apply later than 33 days after planting.

Lasso or Dual and/+ Sencor or Lexone (ALACHLOR or METOLACHLOR and/+ METRIBUZIN) Turbo

2-3 qt Lasso 4L or 4MT and/+.5-1 pt Sencor or Lexone 4L or .33-.66 lb Sencor or Lexone 75DF (2-3 and/+ .25-.5 lb act) ($17.70-29.85)

1.25-2.5 pt Dual 8L and/+ .5-1 pt Sencor or Lexone 4L or .33-.66 lb Sencor or Lexone 75DF (1.25-2.5 + .25-.5) ($15.15-30.30)

1.5-3 pt Turbo

Very good to excellent control of several annual grasses and small-seeded annual broadleaves. Fair to very good control of some large-seeded annual broadleaves. Metribuzin gives best annual broadleaf control of soil applied treatments. Fair crop tolerance. Risk of injury from metribuzin on variable, sandy, high pH, low organic matter soils or on clay knolls. Do not use on soil that is sandy, has a pH over 7.4, or has less than 1% organic matter. Cold, wet soil conditions that slow emergence increase risk of injury. Combined effects of metribuzin with atrazine carryover can produce serious crop injury. Some varieties are more sensitive to metribuzin. Use lower rates for light, lower organic matter soils. Higher rates are for heavy, clay, low pH soils. Sencor or Lexone at .5 pt of 4L or .33 lb of 75DF formulation per acre (.25 lb/A active) usually gives satisfactory control of light infestations of many small-seeded broadleaves and reduces risk of injury. Special labeling for Sencor + Lasso in calcareous soil provides for the use of Sencor at .33 to .5 lb 75DF or .5-.75 pt 4L per acre for wild mustard, lambsquarters, and pigweed, including the use of .33 lb 75DF or .5 pt 4L per acre regardless of soil pH. Use maximum rate for soil type for best control of weeds like sunflower or velvetleaf. May be applied in liquid fertilizer carrier. Minimum carrier is 10 gpa for ground equipment or 2 gpa for Dual with aerial equipment.

Turbo is a premix containing 6.55 lb metolachlor (Dual) + 1.45 lb metribuzin (Sencor) per gallon. Rate of 2.5 pt is approximately equivalent to 2 pt Dual 8L + .9 pt Sencor 4L per acre. Turbo may be applied preemergence or preplant; additional preemergence Sencor may be applied following preplant applications, or it may be applied as a split preplant and preemergence application.

EARLY PREPLANT SURFACE. Dual or Lasso plus Sencor only. Refer to No-Till section.

SHALLOW PREPLANT INCORPORATED. Tank-mix. Incorporate as for Lasso or Dual alone. Will improve results when rainfall is very limited, but gives slightly less control than preemergence application with adequate rainfall. There is slightly less tolerance to metribuzin applied in this manner. Maximum metribuzin rate for most soils is .38 lb/A active. Rates of 2.5 qt Lasso or 2 pt Dual + Sencor or Lexone at .75 pt of 4L or .5 lb of 75DF formulation per acre have been satisfactory in most SDSU tests. Use higher rate for heavy, clay soil.

SPLIT PREPLANT INCORPORATED AND PREEMERGENCE. Incorporate the usual rate of Lasso or Dual shallowly before planting. Apply Sencor or Lexone preemergence after planting. Maximum Sencor or Lexone rate is .75 to 1 pt of 4L or .5-.66 lb of 75DF. Slightly better crop tolerance than for preplant tank-mix, but requires a second application operation.

SPLIT TANK-MIX PREPLANT INCORPORATED AND PREEMERGENCE. Incorporate a tank-mix of the usual rate of Lasso or Dual with Sencor or Lexone as for the preplant incorporated treatment. Apply additional Sencor or Lexone preemergence after planting. Rates for additional Sencor or Lexone range from .25 to .75 pt of 4L or .17 to .5 lb 75DF formulation per acre. Rate of .5 pt of 4L or .33 lb of 75DF Sencor or Lexone formulation per acre has been used as the overlay in most SDSU tests. Allows for better crop tolerance when higher Sencor or Lexone rates are needed for better control of weeds such as velvetleaf. Promising for special situations where broadleaves are serious. Follow label directions carefully.

PREEMERGENCE. Tank-mix. Must have 1/2 to 3/4 inch rainfall within one week. Metribuzin applied preemergence gives slightly better control of broadleaves and has slightly better crop tolerance than preplant incorporated. Maximum metribuzin rate is .5 lb/A active for most heavy soils. Rates of 2 qt Lasso or 2 pt Dual + Sencor or Lexone at .75 to 1 pt of 4L or .5 to .66 lb of 75DF formulation per acre have been satisfactory in most SDSU tests. More convenient than split application.

Lasso or Dual + Lorox (ALACHLOR or METOLACHLOR + LINURON)

1.5-3 qt Lasso 4L or 4MT + 1-3 lb Lorox 50DF or 1-3 pt Lorox 4L (1.5-3 + .5-1.5 lb act) ($15.35-37.75)

1.25-2.5 pt Dual 8L + 1-3 lb Lorox 50DF or 1-3 pt Lorox 4L (1.25-2.5 + .5-1.5 lb act) ($15.55-38.20)

Tank-mix. Very good to excellent control of several annual grasses. Very good control of several small-seeded annual broadleaves. Fair control of some large-seeded annual broadleaves. Good crop tolerance. More risk on light soil. Low rates are for light, low organic matter soils. Higher Lorox rates improve control of some large-seeded broadleaves, but increase risk of injury. Slightly less risk of injury than with metribuzin combinations. Rates of 2 qt Lasso or 2 pt Dual + Lorox at 2 lb of 50DF or 2 pt of 4L formulation per acre have been satisfactory in most SDSU tests. Do not use on sandy soils. Combined effects of Lorox with atrazine carryover can produce serious crop injury. May be applied in liquid fertilizer. Plant seed at least 1 3/4 inch deep. Ground application. Linuron (active ingredient in Lorox) now is available in other tradename products such as Linuron or Linex.
PREEMERGENCE. As for Lasso or Dual alone. Do not incorporate.

Lasso or Dual and/+ Amiben (ALACHLOR or METOLACHLOR and/+ CHLORAMBEN)

2 qt Lasso 4L or 4MT and/+ 4 qt Amiben or 2.4 lb Amiben 75DS (2 and/+ 1.8 lb act) ($27.45)

1.5-2.5 pt Dual 8L and/+ 4-6 qt Amiben or 2.4-3.6 lb Amiben 75DS (1.5-2.5 and/+ 1.8-2.7 lb act) ($26.60-41.60)

Very good to excellent control of several annual grasses. Very good control of several small-seeded annual broadleaves. Fair control of some large-seeded annual broadleaves. Very good crop tolerance. Weed control and crop tolerance affected less by soil variation than with linuron or metribuzin combinations. Low rates are for light, low organic matter soil. Rates of 2 qt Lasso or 2 pt Dual + Amiben at 4 qt or 2.4 lb of 75DS formulation per acre have been satisfactory in most SDSU tests. High Amiben rate improves control of some large-seeded broadleaves. Apply as for Lasso or Dual alone.

SHALLOW PREPLANT INCORPORATED. Tank-mix. Incorporate as for Lasso or Dual alone. Rates of 2.5 qt Lasso or 2 pt Dual per acre have been satisfactory in most shallow incorporated tests with this combination.

PREEMERGENCE. Tank-mix. Preferred application method for most situations.

SPLIT PREPLANT INCORPORATED AND PREEMERGENCE. Incorporate Dual or Lasso shallow preplant incorporated and apply Amiben preemergence. Amiben may be banded to reduce cost.

Command (CLOMAZONE) ($12.75-17.00)

1.5-2 pt Command 4E (.75+1 lb act)

Command + Treflan or Sonalan or Prowl (CLOMAZONE + TRIFLURALIN OR ETHALFLURALIN OR PENDIMETHALIN)

Commence

Command + Lasso or Dual (CLOMAZONE + ALACHLOR or METOLACHLOR)

Command gives excellent control of velvetleaf and very good to excellent control of several other annual broadleaves such as lambsquarters and Venice mallow. Smartweed and ragweed require the higher rates. Pigweed and nightshade control is less consistent; cocklebur is partially controlled. Foxtail control is very good in some tests but has been variable. Velvetleaf is highly sensitive. Excellent crop tolerance. There are no restrictions for high soil pH; however, carryover potential may increase at pH below 6.0. Velvetleaf control is usually satisfactory with 1.5 pt/A in most soils; use 2 pt/A for heavy, high organic matter soil or for less susceptible weeds. Combination with other herbicides will improve pigweed control and improve consistency of grass control. Preplant incorporated Command may be followed by preemergence or postemergence herbicides used according to directions. Affected plants show distinct chlorosis or bleaching of leaf tissue. There is some risk of soil residual affecting sensitive crops planted the next year. Do not rotate to wheat, oats, barley, rye, alfalfa, or grass the following spring. Treated fields may be rotated to corn or sorghum. Some temporary whiteness may be noted, especially in spray overlaps or if it is very dry. Minimum carrier is 10 gpa for ground equipment. An additive to reduce droplet drift is required if using less than 15 gpa carrier. Incorporated Command may be applied in liquid fertilizer carrier or impregnated on certain dry fertilizers. Avoid application when spray may be carried to non-target vegetation. Ornamental and fruit trees, shrubs, evergreens, oats, alfalfa, and several garden plants are sensitive and will show whitening if contacted by the herbicide. Do not apply within 1000 ft of housing areas and commercial nurseries or within 100 ft of other sensitive plants. Wind should not exceed 7 mph; use at least 10 gpa carrier and a drift reducing additive when required.

PREPLANT INCORPORATED. Command must be incorporated. This reduces off-site vapor drift movement, especially from moist soil surface. Incorporate immediately into the top 3 inches of soil. On dry soil, incorporation may be delayed up to 8 hours if necessary. One- or two-pass incorporation is possible. Field cultivator should have three or four rows of sweeps spaced no more than 7 inches. A disk or field cultivator may be used for two-pass systems.

TANK-MIXES. Command is usually applied in combination with other herbicides to improve grass control or improve the broadleaf spectrum.

.75-1.5 pt Command 4L + 1-2 pt Treflan 4L (.38-.75 + .5-1 lb act) ($9.80-19.45)

.75-1.5 pt Command 4L + 1.25-3 pt Sonalan 3L (.38-.75 + .5-1.1 lb act) ($10.45-22.30)

.75-1.5 pt Command 4L + 1-2.5 pt Prowl 4L (.38-.75 + .5-1.25 lb act) ($9.65-20.70)

1.75-2.67 pt Commence 5.25L (.5-.75 + .65-1 lb act)

PREPLANT INCORPORATED. Tank-mix or use commercial premix. Commence 5.25L is a premix containing 3 lb trifluralin (Treflan) + 2.25 lb clomazone (Command) per gallon. Rates are 1.75 to 2.67 pt/A. Rate of 2 pt used in most SDSU tests provides approximate equivalent of 1.5 pt Treflan 4L plus 1.1 pt Command 4L per acre. Results with this rate have been satisfactory on most medium soil with scattered or light to moderate velvetleaf infestations. Combination expected to improve consistency of grass control and will improve pigweed control with the higher Treflan or Sonalan rates. Use high Command rate for most consistent velvetleaf control. Apply as for Command alone.

1-2 pt Command 4L + 2-3 qt Lasso 4L or 4 MT (.5-1 + 2-3 lb act) ($19.50-33.50)
1.5-2 pt Command 4L + 1.5-2 pt Dual 8L (.75-1 + 1.5-2 lb act) ($22.90-30.55)

SHALLOW PREPLANT INCORPORATED. Tank-mix. Combination improves consistency of grass control. Use high Command rate for most consistent velvetleaf control in heavy infestations or in heavy soil. Incorporation depth as for Lasso or Dual.

Classic (CHLORIMURON-ETHYL) ($7.75-11.60)

.5-.75 oz Classic 25DF (.008-.012 act)

Classic controls redroot pigweed, smartweed, cocklebur, and ragweed. Velvetleaf is suppressed. Sunflower and pigweed control has been good in SDSU tests. Applications may be split 12 to 24 days if a second application is required to achieve desired control. Crop tolerance appears very good. Weed control has been consistent in SDSU tests, unless weeds exceed growth stage.

Classic may persist in the soil and damage susceptible crops the next season. Use is limited to soils with less than 7.0 pH. Carryover is increased considerably with higher pH. Rainfall is not a major factor in dissipation when used according to pH guidelines. For soils with less than 7.0 pH, cereal grains can be planted 3 months after application; corn, sorghum, alfalfa, clover, and dry beans can be planted 9 months after application. Apply in a minimum of 10 gpa for ground and 3 gpa by air. Add surfactant at 1 qt or crop oil concentrate at 1 gal per 100 gallons of solution. Nitrogen fertilizer at 1 gal/100 plus crop oil concentrate is suggested for velvetleaf.

POSTEMERGENCE. Apply when weeds are small for best results. Pigweed and smartweed should be 2 to 4 inches; sunflower should not exceed 8 inches, and cocklebur should not be over 12 inches.

Basagran (BENTAZON) ($10.10-13.45)

.75-1 qt Basagran 4L (.75-1 lb act)

POSTEMERGENCE. Excellent control of cocklebur and very good control of small sunflower and velvetleaf. Pigweed, nightshade, and kochia usually are not controlled. Weeds should be small for best results. Soybeans are usually in the unifoliate to 2-trifoliate leaf stage, but are tolerant at all growth stages. Excellent crop tolerance. Some leaf margin burn may occur if plants are under stress. Best results under good growing conditions; less effective under low humidity or dry conditions. Rainfall within 8 hours reduces effectiveness.

The low rate is for cocklebur under 6 inches, velvetleaf under 2 inches, or sunflower or mustard under 4 inches. High rate is for larger weeds but before cocklebur is 10 inches, velvetleaf 5 inches, or sunflower or mustard 6 to 7 inches.

Primarily contact action. Good coverage important. Minimum carrier is 20 gpa for ground or 5 gpa for air with minimum of 40 psi boom pressure. Do not use flood-jet nozzles. Very small amounts of 2,4-D or Banvel contamination in tank, hoses, boom or container can cause severe damage. Do not cultivate for 3 to 5 days after application. See special weed problem section for perennial weed control.

Petroleum-base non-phytotoxic oil concentrate is suggested for some situations. Oil is suggested for ragweed and lambsquarters. Not required for cocklebur. Maximum oil rate is 1 qt/A for ground and 1 pt/A for air. Crop leaf burn is usually not increased except with very high temperature or high humidity. For velvetleaf, 28% nitrogen solution fertilizer at 1 gal/A is suggested in place of crop oil. Effectiveness is usually improved and crop tolerance is satisfactory.

SPLIT POSTEMERGENCE. Two applications will improve control of certain weeds such as sunflower, mustard, velvetleaf, and Venice mallow. Apply 1 pt/A when weeds are small and make a second application of 1 pt/A 10 to 14 days later. Velvetleaf, mustard, or Venice mallow should not exceed 2 inches; sunflower should not exceed 3 inches for the first application. This plan makes it possible to treat early before emergence may be completed; in some situations a second application may not be needed. Best sunflower control in SDSU tests is with split application of 1.5 pt/A followed by 1 pt/A 10-14 days later. Late season treatment of two applications of .75 qt/A applied 10 to 14 days apart or a single application of 1.5 qt/A will give partial control of cocklebur up to 24 inches.

Preview (METRIBUZIN + CHLORIMURON-ETHYL)

6-10 oz Preview 75DF

Commercial premix containing 68.5% metribuzin (Lexone) + 6.5% chlorimuron-ethyl. Intended for annual broadleaf control. Provides excellent control of pigweed, smartweed, mustard, and lambsquarters. Sunflower, cocklebur, and velvetleaf control is good to very good but may be somewhat variable under dry soil conditions. Weak on nightshade. Crop tolerance is adequate on labeled soils. Effect of atrazine carryover will be additive. Do not use on sandy soil (.5% OM). Avoid sensitive varieties listed on the label. The maximum rate of 10 oz of 75DF has metribuzin equivalent to .5 lb of Lexone 75DF.

Preview is labeled for use only on soil with a 6.8 pH or less. Carryover is increased significantly on higher pH soil. Soybeans, wheat, or barley may be planted 4 months after application, corn or alfalfa 10 months, and sorghum or clover 12 months after treatment.

Apply in minimum of 10 gpa carrier. May be applied in liquid fertilizer carrier.

EARLY PREPLANT OR PREPLANT INCORPORATED. May be applied up to 30 days before planting. Incorporated applications should be thoroughly mixed into the top 1-2 inch of soil. Incorporation directions for the tank-mix product used for most combination treatments.

PREEMERGENCE. Rainfall required. Apply before soybeans emerge. May also be used with surfactant additive to provide burndown of small weeds in no-till.

TANK-MIXES. Preview is usually applied as a tank-mix with other herbicides. Labeling includes preplant combinations with Treflan, Prowl, Dual, Lasso, Command or Sonalan. Preemergence combinations include Lasso, Dual, Surflan, or preemergence Preview over preplant incorporated herbicides.

Lorox Plus (LINURON + CHLORIMURON-ETHYL)

12-18 oz Lorox Plus 60DF

Commercial premix containing 56.9% linuron (Lorox) + 3.1% chlorimuron-ethyl. Intended for broadleaf control. Pigweed, smartweed, mustard, and lambsquarter control is excellent. Also is very effective on cocklebur when moisture is favorable. Velvetleaf and sunflower control is good. Not effective on grasses. Crop tolerance is good. Avoid very sandy soil. Some additive effect with atrazine carryover. Accurate application to avoid overlaps is important. Maximum rate of 18 oz/A provides linuron equivalent to 1.5 pt of Lorox 4L.

Lorox Plus is for soils with a pH of 6.8 or less. Carryover risk increases considerably on higher pH soils. Rainfall is a less critical factor in carryover. Wheat, barley, oats or rye can be planted 4 months after application; field corn and sorghum after 10 months and clover after 12 months.

Apply in a minimum of 10 gpa carrier.

EARLY PREPLANT or PREPLANT INCORPORATED. May be applied up to 30 days before planting as a surface application or incorporated into the top 1-2 inches of soil. Avoid deep incorporation. Do not use a disk.

PREEMERGENCE. Must be applied before crop emergence. Requires rainfall. Surfactant may be added to provide burndown of small, emerging weeds.

TANK-MIXES. Lorox Plus is usually used as a tank-mix component with other herbicides to improve grass control. Labeling includes several combination treatments with preplant or preemergence herbicides. Treflan, Sonalan, Dual, or Lasso may be used in preplant incorporated applications. Preemergence Lorox Plus can be tank-mixed with Lasso, Dual, or Surflan or may be applied following an incorporated application of Treflan, Prowl, or Sonalan.

Blazer or Tackle (ACIFLUORFEN) ($6.30-18.95)

1-2 pt Blazer 2L or 1-3 pt Tackle 2L (.25-.75 lb act)

POSTEMERGENCE. Good to excellent control of certain annual broadleaves, including black nightshade, pigweed, and wild mustard. Results on velvetleaf and cocklebur are more variable. Topgrowth burn on field bindweed and Canada thistle has been satisfactory in most situations. Some annual grass suppression noted. Fair crop tolerance. Leaf burn or speckling is frequently noted. Crop recovers rapidly under good growing conditions. Most risk is during times of high humidity and high temperature. Delay cultivation for 7 days before or after application. Rainfall within 6 hours reduces control.

Primarily a contact herbicide. Good coverage is important. Apply when weeds are small, at the 2- to 4-leaf stage, usually within 21 days after crop emergence. Rate of 2 pt/A has been used in most SDSU tests. Low rates primarily for susceptible weeds such as wild mustard. For Blazer, add 1 pt non-ionic surfactant per 100 gal of solution. Increase the surfactant to 2 to 4 pt for escaped grasses at the 2- to 4-leaf stage, lambsquarters, buffalo bur, and other hard to control weeds. Fields may be retreated if necessary. For Tackle, use 2 pt non-ionic surfactant per 100 gal of solution. Crop oil concentrate may be used in place of surfactant; however, leaf burn usually increases considerably. Increase the Tackle rate to 3 pt/A for escaped grasses or more difficult weed species. The use of 1 gal/A 28% nitrogen fertilizer as an additive improves velvetleaf control and causes less crop leaf burn than crop oil. Do not use flood nozzles. Minimum carrier is 20 gpa for ground and 5 gpa for air. Use 40 to 60 psi pressure. Do not apply within 50 days of harvest.

Cobra (LACTOFEN)

.75 pt Cobra 2L (.15-.2 lb act)

POSTEMERGENCE. Good to excellent control of several annual broadleaves, including pigweed and wild mustard, nightshade, and buffalo bur. Results on cocklebur and velvetleaf have been more variable. Fair to marginal crop tolerance. Leaves present at treatment will show some speckling or discoloration; newest leaves may show some crinkling. Leaf burn is greatest in humid, hot weather. Crop recovers under good growing conditions. Do not cultivate for 5 days before treating.

Primarily a contact herbicide. Apply when weeds are small, usually at the 2- to 4-leaf stage. The lower rate is effective on most susceptible species when small. Use the higher rate for sunflower, velvetleaf, and lambsquarters. Use non-ionic surfactant at 2 pt/100 gal of spray solution for most applications; crop oil concentrate at .5 to 1 pt/A will improve results, but will also increase leaf burn in most situations. Nitrogen fertilizer may be added at 1 gal/A to improve control of certain weeds. Minimum carrier is 20 gpa for ground and 5 gpa for aerial application. Crop oil concentrate at 1 pt/A has been approved for aerial application. Use 40 to 60 psi to insure good coverage.

Basagran + Blazer or Tackle (BENTAZON + ACIFLUORFEN) ($9.85-26.05)
Galaxy

1-2 pt Basagran 4L + .5-2 pt Blazer 2L or 1-2 pt Tackle 2L (.5-1 + .12-.5 lb act)
2 pt Galaxy

POSTEMERGENCE. Tank-mix or Galaxy commercial premix containing 3 lb bentazon (Basagran) plus .67 lb acifluorfen per gallon. Combination intended to provide control of more species than either herbicide used alone. Blazer or Tackle improves the control of pigweed and lambsquarters. Basagran is best for velvetleaf or cocklebur. Suggested rates vary according to the product label. The rates range from 1 to 2 pt Basagran plus 1 to 2 pt Blazer or Tackle per acre. The rate may be adjusted to about 75% of the normal rate of the herbicide which will give the best control of the predominant weed and about 50% of the normal rate of the other product. The rate of 1.5 pt of each is suggested for heavy stands of mixed weed species. Use at least 1 pt/A Basagran in the mixture to control cocklebur up to the 6-leaf stage and at least 1.5 pt/A Basagran if velvetleaf is a significant problem. Lower rates with fertilizer additives appear promising for controlling small velvetleaf when conditions are favorable. Directions for rates and kind of additive vary on product labels. Non-ionic surfactant at 1 pt per 100 gal of solution should be used for general application. Surfactant should be increased to 2 to 4 pt/100 gal of solution for escaped grasses. For most severe weed situations, crop oil may be increased to 1 qt/A; however risk of foliage burn increases. Diammonium phosphate, commonly available in a water soluble fertilizer (10-34-0), at 1 qt/A or 28% nitrogen solution fertilizer at 1 gal/A may be used as a replacement for surfactant or crop oil. Velvetleaf control is improved. Leaf burn is less than for crop oil. Weeds should be less than 2 or 3 inches tall for best results. Minimum tank-mix carrier is 20 gpa for ground or 5 gpa for air.

Poast (SETHOXYDIM) ($6.20-30.95)

.5-2.5 pt Poast 1.5L (.1-.5 lb act)

POSTEMERGENCE. Very good to excellent control of annual grasses. Wild proso millet is controlled with lowest rate. Volunteer corn usually requires the higher rates. Provides some short-term suppression of quackgrass at high rate. Does not control broadleaves. Excellent crop tolerance.

Growth rate of treated grasses is reduced soon after application. Yellowing, reddening, and tip burn all usually noted within 3 weeks after application. Rates are .5 pt/A for wild proso (4-10 in); .75 pt/A for foxtail and barnyardgrass (to 4 in), and volunteer corn (6 to 12 in); 1 pt/A for wild cane (6-18 in); 1.5 pt/A for wild oats (2-4 in); and 2.5 pt/A for quackgrass (6-8 in). Quackgrass can be retreated with another 1.5 pt/A when regrowth reaches 6 to 8 inches.

Crop oil concentrate at 1 qt/A is used with all Poast applications. Ammonium sulfate at 2.5 lb/A or 28% nitrogen fertilizer solution may be used in addition to crop oil concentrate for improved control of volunteer corn and quackgrass. Use feed grade or other high quality product. Avoid cultivation for one week before and one week following application. Rainfall within one hour after application will reduce effectiveness. Control of weeds under drought stress is diminished.

Coverage is important. Use flat fan or hollow cone nozzles. Minimum carrier is 10 gpa for ground and 5 gpa for air. Tank-mixing with other herbicides except as noted on the label can reduce effectiveness. Allow at least one day between sequential applications of other herbicides. Pressure should be 40 to 60 psi. Do not apply within 70 days of harvest. Avoid drift to sensitive crops such as corn, sorghum, or cereals. Poast is formulated as a 1.5 lb/gal liquid.

Poast and/+ Basagran (SETHOXYDIM AND/+ BENTAZON) ($16.25-44.30)

.5-2.5 pt Poast 1.5L and/+ .75-1 qt Basagran 4L (.1-.5 and/+ .75-1 lb act)

Sequential or tank-mix. Rates and growth stages for specific weeds as for Poast or Basagran alone. Add crop oil concentrate as specified for each. Refer to section for Poast or Basagran alone.

SEQUENTIAL POSTEMERGENCE. Growth stage of weeds determines sequence; usually annual broadleaves reach treatment stage first. Allow at least 24 hours between applications, regardless of sequence. Sequential preferred.

TANK-MIX POSTEMERGENCE. May be tank-mixed if grasses and broadleaves are both at proper growth stage; however, the rate of Poast should be increased 50% from that listed to compensate for antagonism. Crop oil concentrate at 1 qt/A should be used. The use of 1 qt/A Dash with 1 gal/A 28% nitrogen fertilizer additive reduces the antagonism. Additional Poast is not usually required if the Poast rate is at least 1 pt/A. Use 2 to 4 qt/A 28% nitrogen as an additive to enhance control.

Poast and/+ Blazer or Tackle (SETHOXYDIM AND/+ ACIFLUORFEN)
Poast and/+ Basagran + Blazer or Tackle (SETHOXYDIM AND/+ BENTAZON + ACIFLUORFEN)

.5-2.5 pt Poast 1.5L and/+ 1.5-2 pt Blazer or Tackle 2L (.1-.5 and/+ .38-.5 lb act) ($15.80-43.55)

.5-2.5 pt Poast 1.5L and/+ 1-2 pt Basagran 4L + 1-2 pt Blazer or Tackle 2L (.1-.5 and/+ .5-1 + .25-.5 lb act) ($19.20-57.00)

Sequential or tank-mix. Rates and growth stages for specific weeds as for Poast or Blazer or Tackle or Poast + Blazer or Tackle used as separate applications.

SEQUENTIAL POSTEMERGENCE. Growth stage of weeds determines sequence; usually annual broadleaves reach treatment stage first. If Blazer or Tackle or Basagran + Blazer or Tackle is applied first, allow time for grasses to resume growth and produce one new leaf. Usual time interval is 7 to 10 days before Poast should be applied. If Poast is applied first, allow at least 24 hours before applying the other herbicide. Use rates and surfactant or crop oil specified in the sections for each herbicide used alone. Sequential preferred.

TANK-MIX POSTEMERGENCE. These treatments can be tank-mixed if grasses and broadleaves are both at proper growth stages; however, the rate of Poast should be increased 50% from that listed to compensate for antagonism. Crop oil concentrate at 1 qt/A is specified. Expect more leaf burn with crop oil in the tank-mix than with a sequential treatment where surfactant is used with Blazer or Tackle.

Fusilade 2000 (FLUAZIFOP-BUTYL) ($8.25-16.45)

.75-1.5 pt Fusilade 1L (.1-.2 lb act)

POSTEMERGENCE. Good to excellent control of wild proso millet, wild cane, and volunteer corn with lowest rates. Fair to good control of annual grasses. Foxtail usually requires the higher rate. Provides in-season suppression of quackgrass. Does not control broadleaved weeds. Excellent crop tolerance.

Growth rate of treated grasses is reduced soon after application. Weeds show leaf yellowing or browning 10 to 14 days after treatment. Control of foxtail has been variable under moisture stress conditions. Volunteer corn control is more consistent.

Use .75 pt/A for wild proso (6-12 in), wild cane (6-12 in), volunteer corn (12-24 in). Use 1 pt/A for wild oats and volunteer small grain (2-6 in). Use 1.5 pt/A for barnyardgrass (2-3 in), foxtail and witchgrass (2-4 in). For quackgrass, apply 1.5 pt/A when quackgrass is 6 to 10 inches. Make a second application using 1 pt/A 2 to 3 weeks after the first application if required.

Use 1 qt crop oil concentrate or .5 pt non-ionic surfactant per 25 gal of solution with all Fusilade applications. Avoid cultivation for one week before and one week after application. Rainfall within one hour after application will reduce effectiveness.

Coverage is important. Do not use flood nozzles. Minimum carrier is 5 gpa for ground or aerial application. Use 40 to 60 psi. Tank-mixing with other herbicides can reduce effectiveness.

Do not apply after soybeans begin to bloom. Do not plant crops other than soybeans for 60 days after application. Avoid drift to sensitive crops such as corn, sorghum, or cereals.

Fusilade 2000 and/+ Blazer or Tackle (FLUAZIFOP-BUTYL AND/+ ACIFLUORFEN) ($17.80-29.05)

.75-1.5 pt Fusilade 1L and/+ 1.5-2 pt Blazer 2L or 1.5-3 pt Tackle 2L (.1-.2 + .38-.75 lb act)

Apply Fusilade at rate and grass growth stages as for Fusilade alone and Blazer or Tackle at rate and growth stages as for Blazer or Tackle used alone. Add surfactant or crop oil as directed for each. Refer to section for Fusilade and Blazer or Tackle alone.

SEQUENTIAL POSTEMERGENCE. Growth stage of weeds determines sequence; usually annual broadleaves reach treatment stage first. If Blazer or Tackle is applied first, allow time for grasses to resume growth and develop a new leaf. Usual time interval is 7 to 10 days before Fusilade should be applied. If Fusilade is applied first, allow 3 days for annuals and 5 days for perennials before applying Blazer or Tackle. Sequential preferred.

TANK-MIX POSTEMERGENCE. These herbicides may be tank-mixed if grasses and broadleaves are both at the proper growth stage. Use the rate recommended for each herbicide used alone. Use surfactant additive as for Fusilade alone. Crop oil increases risk of crop injury; apply as for Blazer or Tackle alone. Some reduced grass control may be noted due to antagonism. Tank-mix not suggested if grasses are perennial.

Fusilade 2000 and/+ Basagran (FLUAZIFOP-BUTYL + BENTAZON) ($18.30-29.90)

.75-1.5 pt Fusilade 1L and/+ .75-1 qt Basagran 4L (.1-.2 + .75-1 lb act)

Sequential or tank-mix. Rates and growth stages for specific weeds as for Fusilade or Basagran alone. Apply crop oil concentrate as directed. Refer to section for Fusilade or Basagran alone.

SEQUENTIAL POSTEMERGENCE. Growth stage of weeds determines sequence; usually annual broadleaves reach treatment stage first. Allow at least 24 hours between applications, regardless of sequence. Sequential preferred.

TANK-MIX POSTEMERGENCE. May be tank-mixed if grasses and broadleaves are both at the proper stage. Some reduced grass control may be noted compared to sequential application; a 50% increase in Fusilade rate will compensate. Fusilade may be used alone to retreat if necessary. Use 2 pt/A crop oil additive.

Whip/Option (FENOXYPROP-ETHYL) ($9.75-14.60)

.8-1.2 pt Whip/Option 1L (.1-.15 lb act)

POSTEMERGENCE. Good to excellent control of wild proso millet, foxtail, and volunteer corn. Wild proso millet and volunteer corn are controlled with the lower rate. Does not control broadleaves. Excellent crop tolerance.

Weed growth is reduced soon after application. Symptoms appear in 7 to 10 days. Moisture stress reduces activity. Rates are .8 pt/A for wild proso millet (.5-10 in) and volunteer corn (10-16 in); 1.2 pt/A for 3 to 6 inch barnyardgrass, green foxtail, wild oat, and robust foxtails and crabgrass (1-2 in).

Crop oil concentrate at 1 qt/A is suggested for all Whip applications; always use if grasses are larger. Rain within one hour of application reduces control. Do not cultivate four days before or after application. Avoid drift to adjacent sensitive crops. Apply before bloom stage of crop.

Coverage is important. Minimum carrier is 10 gpa for ground and 5 gpa for aerial application. Minimum pressure is 40 psi.

Whip or Option/ + Basagran (FENOXYPROP ETHYL + BENTAZON) ($19.80-32.90)
Whip or Option/ + Blazer or Tackle (FENOXYPROP ETHYL + ACIFLUORFEN) ($19.35-32.10)

.8-1.6 pt Whip or Option 1L + 1.5-2 pt Basagran 4L (.1-.16 + .75-1 lb act)
.8-1.6 pt Whip or Option 1L + 1.5-2 pt Blazer or Tackle 2L (.1-.16 + .38-.5 lb act)

SEQUENTIAL or TANKMIX. Rates and growth stages for specific weeds as for Poast or Basagran alone. Refer to section for Poast or Basagran alone.

SEQUENTIAL POSTEMERGENCE. Growth stage of weeds determines sequence; usually annual broadleaves require treatment first. No waiting period on sequential with Basagran. With Blazer/Tackle sequentials, if Blazer or Tackle is used first a 7 day waiting period is necessary; with Whip or Option first, wait 3 days.

TANK-MIX POSTEMERGENCE. May be tank-mixed if grasses and broadleaves are both at proper growth stage. When mixing with Basagran, Whip or Option rates are 1.2 to 1.6 pints per acre. Treatments with Basagran also require the addition of crop oil concentrate. Blazer or Tackle mixes require Whip or Option at 1.6 pints per acre. Do not add crop oil concentrate with this mix.

Assure (QUIZALOFOP)

.6-1.25 pt Assure .8L (.06-.125 lb act)

POSTEMERGENCE. Good to excellent control of foxtail, volunteer corn and wild proso millet. Corn, shattercane, and wild proso millet are controlled at the lower rates. Does not control broadleaves. Excellent crop tolerance. Weed growth is reduced soon after application. Symptoms usually appear in 1 to 2 weeks. Moisture stress reduces activity.

Rates are .6 pt/A for volunteer corn (6-18 in), shattercane (6-12 in), wild proso millet (2-6 in); .9 pt/A green, yellow, bristly foxtail (2-4 in), giant foxtail (2-8 in), fall panicum (2-6 in), sandbur (2-6 in), wheat, barley, rye, oats, wild oat (2-6 in); 1 pt/A barnyardgrass (2-6 in), crabgrass (2-6 in); 1.25 pt/A for quackgrass (6-10 in).

Add crop oil or non-ionic surfactant at 4 qts/100 gal solution for ground or 2 qt/100 gal solution for air. Do not apply if rain is expected within 1 hour after application. Do not cultivate within 7 days before or after application.

Coverage is important. Use flat fan or hollow cone nozzles. Minimum carrier is 10 gpa for ground and 3 gpa for air. Tank-mixing with other herbicides, except as noted on label, can reduce effectiveness. Avoid drift to sensitive crops such as corn, sorghum, or cereals. Do not apply within 80 days of harvest. Do not rotate to other crops for 120 days.

Assure and/+ Classic or Basagran (QUIZALOFOP and/+ CHLORIMURON-ETHYL or BENTAZON)

.6-1.25 pt Assure .8L + .5-.75 oz Classic 25DF (.06-.125 + .008-.012 lb act)
.6-1.25 pt Assure .8L + .75-1 qt Basagran 4L (.06-.125 + .75-1 lb act)

Tank-mix. Combination treatments broaden weed spectrum to include both grasses and broadleaves. Refer to section for Assure or Classic alone.

SEQUENTIAL POSTEMERGENCE. Follow directions to reduce antagonistic response. Allow at least 24 hours after applying Assure before applying Classic or Basagran. If applying Classic or Basagran first, allow about 7 days for grass plants to produce new leaf growth before applying Assure.

TANK-MIX POSTEMERGENCE. Some reduced grass control can be expected due to antagonism. The rate of Assure should be increased 4 fl oz from the rate listed above. Tank-mix with Classic or Basagran should not be used for less susceptible weeds such as barnyardgrass, crabgrass, or perennials like quackgrass. Split application preferred. Add surfactant or crop oil as for Assure alone.

Roundup (GLYPHOSATE)

Roundup is a non-selective, translocated, foliage applied herbicide used as a spot treatment for perennials or in specialized application equipment. These techniques allow selective control of special weed problems such as volunteer corn or wild cane.

SPOT TREATMENT. Roundup may be used at 2 to 4 qt/A to control small patches of perennial weeds such as quackgrass or Canada thistle. It is usually applied with hand-held equipment. Use extreme caution to prevent drift. Crop contacted by spray or drift will be damaged or killed. Refer to label for mixing directions and precautions.

SPECIAL APPLICATION EQUIPMENT. Roundup used in special equipment gives very good control of volunteer corn or wild cane. Results with sunflower have been fair. Control of milkweed and hemp dogbane has been more erratic. A height differential is required so the taller weeds are treated over the top of the soybeans. Uniform weed emergence and sufficient height differential improve results. Equipment is usually operated at 3 to 5 mph. Do not add 2,4-D or other herbicides. Consult label directions for the equipment being used.

"Hand-held" motorized equipment such as a self-propelled "buggy" is popular for treating individual weeds. Most effective for volunteer corn, wild cane, and other grasses. Higher concentrations and more complete coverage are required for perennials or broadleaved annuals. A 5% solution (5 qt Roundup in 25 gal) is suggested for most equipment. Lower concentrations (3%) have been effective for volunteer corn if all plants are uniformly covered. Control is best if 1/3 to 1/2 of the plant is sprayed. The use of dye will be helpful in application on grassy annual weeds.

"Recirculating Sprayers (RCS)" direct the spray across the top of the soybeans. Box types operate between the rows and broadcast types operate independent of row spacing. Spray not intercepted by the weeds is collected in a recovery chamber and goes back through the system. The RCS has been more effective than the rope wick for hemp dogbane and milkweed. The concentration of Roundup varies from 2 to 6 qt per gallon of water. One gallon of Roundup will usually treat 16 to 20 acres. Equipment must be operated in a manner that minimizes droplet drift and "splash" effects.

"Rope Wick" applicators utilize segments of soft, braided nylon rope which serve as wicks. The rope ends are affixed through a hole into a 3- to 4-inch plastic pipe. The ropes remain wet by diffusion as they wipe the taller weeds. Variations of the wick applicator feature longer, diagonal ropes which are wetted from a supply tank. Wick applicators are inexpensive, efficient, and simple to operate. Drift and splash problems are essentially eliminated. Equipment must be operated to avoid "drips" from the ropes. The solution in the pipe or tank is mixed at a ratio of 1 gallon Roundup to 2 gallons of water. One gallon of Roundup will usually treat 50 to 100 acres.

Gramoxone Super (PARAQUAT) ($3.60-7.20)

.75-1.5 pt Gramoxone Super 1.5L (.15-.3 lb act)

HARVEST AID. Apply .75-1.5 pt/A Gramoxone Super when at least 65% of the seed pods have reached a mature color or when seed moisture is under 30%. The purpose is to dry weeds to facilitate harvest. Paraquat is the only desiccant labeled for soybeans. Less effective on large kochia or Russian thistle than on other actively growing weeds. Contact treatment. Minimum carrier is 20 gpa for ground or 2 gpa for air. Add 1 qt X-77 spreader per 100 gal of solution. Do not graze treated soybean fields for 15 days after spraying, and remove livestock at least 30 days before slaughter. Follow handling precautions, as paraquat is highly toxic. Restricted Use Pesticide.

OTHER SOYBEAN HERBICIDES

Scepter (IMAZAQUIN) ($7.50-15.00)

.33-.66 pt Scepter 1.5L (.06-.125 lb act)

Labeling includes preplant incorporated, preemergence or postemergence application in South Dakota east of Hwy 81. Scepter provides excellent control of several annual broadleaves and limited control of annual grasses. Labeling includes a range for all soil applied treatments. Lower rates in combination may provide adequate control of most susceptible weeds, but reduced control of some species may be noted, especially in dry conditions.

Activity is achieved through root and/or foliar uptake and translocation to growing points. Scepter gives excellent control of pigweed species, smartweed, lambsquarters, kochia, sunflower and Venice mallow. Cocklebur control has been satisfactory, but is more variable in dry conditions. Velvetleaf and black nightshade control has been good to very good; these weeds are controlled best with preplant incorporated applications.

Crop tolerance appears very good. Risk of internode shortening has not been significant in SDSU tests. There are no major soil pH or texture limitations.

Soil residue may affect susceptible crops planted the following season. Scepter labeling prohibits planting field corn, wheat, barley, oats, or other sensitive crops in the fall or spring following a soil application at any rate or a postemergence application at rates above .33 pt/A. This limits rotation to soybeans, edible beans, grain sorghum or fallow/set aside for most situations. Postemergence applications not exceeding .33 pt/A may be rotated to wheat in 4 months; barley, oats, field corn, edible beans or grain sorghum in 11 months, if at least 15 inches of rainfall occured from application through October. Other rotational crops should not be planted for 18 months. Risk of carryover is greater after dry, cool seasons.

Corn is more sensitive to carryover than wheat or sorghum. Stand reduction has been noted on oats or barley; spring wheat planted over normal use rates has not been affected in SDSU plots, although damage has occurred in other field strip tests. Corn stunting and some stand reduction has occurred in field situations; visual effects have been observed on no-till corn planted into unworked soybean stubble where Scepter was used the previous year. Corn injury has not been observed where the field preparation included fall plowing and spring tillage of treated soybeans. Applicaiton and incorporation uniformity is critical, especially in dry season. Overlap areas or streaks due to incorporation should be avoided.

Apply in 20 gpa for ground or 5 gpa for aerial application. Soil treatments may be applied in liquid fertilizer carrier.

PREPLANT INCORPORATED: Incorporate into the top 1 to 2 inches of soil. Rate is .66 pt/A; .5 pt/A may be used on light soil. Application may be made up to 45 days before planting. Uniform, thorough incorporation is important for best performance. Double pass incorporation required if using disk or field cultivator. Preplant results have been most consistent. Early preplant surface applications currently are not labeled unless incorporated.

PREEMERGENCE: Apply before crop emergence. Rates as for preplant incorporated. Incorporate with a rotary hoe or harrow if rainfall is not received within 7 days.

POSTEMERGENCE: Apply before weeds reach 12 inches. Rate is .33-.66 pt/A. The low rate is primarily for pigweed and mustard. Control of sunflower has been very good; velvetleaf control has been less than for preplant incorporated applications. Add 1 qt surfactant per 100 gallons solution.

Scepter is usually tank-mixed with other herbicides to improve grass control. Several tank-mixes have been labeled and are listed below. For reduced or no-till situations, Scepter may be used in combination with paraquat, Roundup or Bronco.

.66 pt Scepter 1.5 L or 1-2 pt Prowl 4L (.125 + .5-1 lb act) ($18.20-21.35)

3 pt Squadron

Preplant incorporated. Tank-mix or Squadron commercial premix containing .33 lb imazaquin + 2 lb pendimethalin per gallon. Squadron use is limited to Lincoln, Yankton, Union, Clay and Turner counties in South Dakota. Squadron at 3 pt/A is equivalent to 1.5 pt Prowl + .66 pt Scepter. Results in most SDSU tests have been excellent.

.66 pt Scepter 1.5L + 1-2 pt Trifluralin 4L (.125 + .5-1 lb act) ($18.35-21.70)

Preplant incorporated. Tank-mix. Results in most SDSU tests have been excellent. Tri-Scept, a commercial premix containing .43 lb imazaquin + 2.57 lb trifluralin per gallon may also be available. Rate of 2.33 pt/A is equivalent to 1.5 pt trifluralin 4L + .66 pt Scepter 1.5L.

.66 pt Scepter 1.5L + 2-3 qt Lasso 4L or 4MT or 1.5-2.5 pt Dual 8L (.125 + 2-3 or 1.5-2.5 lb act) ($26.00-21.50) ($25.15-21.95)

Tank-mix. Preplant incorporated within 7 days for Lasso or 14 days for Dual of planting or preemergence. Rainfall required for surface application. Results have been very good in SDSU tests. Labels vary on incorporation.

1.5-2 pt Command 4L +/and .33-.5 pt Scepter 1.5L (.75-1 +/and .06-.09 lb act) ($20.25-32.00)

Tank-mix or split application. Tank-mix preplant incorporated or split application of Scepter postemergence following preplant incorporated Command. Rate of Scepter is less than for several other combinations. Limited SDSU data on reduced Scepter rates. Scepter improves control of other broadleaves. Excellent for velvetleaf and Venice mallow. Postemergence Scepter at these rates is labeled for cocklebur and pigweed. Refer to Command alone.

.66 pt Scepter 1.5L + 1-2 pt Prowl 4L + .25-.5 pt Command 4L (.125 + .5-1 + .125-.25 lb act) ($20.40-25.60)

Tank-mix. Preplant incorporated. Incorporate as for Prowl or Command alone. Command improves velvetleaf control.

.66 pt Scepter 1.5L + 1-2 pt Trifluralin 4L + .25-.5 pt Command 4L (.125 + .5-1 + .12-.25 lb act) ($20.50-25.95)

Tank-mix. Preplant incorporated. Incorporate as for trifluralin or Command alone. Command improves velvetleaf control.

1.5-2 pt Basagran 4L + .33 pt Scepter 1.5L (.75-1 + .06 lb act) ($17.60-20.95)

Tank-mix. Postemergence. Include 1 qt/A crop oil concentrate. Reduced rate of Scepter compared to Scepter alone. Apply as for Basagran. Improves control of pigweed, kochia, and sunflower when compared to Basagran alone. Scepter provides some residual activity.

.5-.66 pt Scepter 1.5L + 1.5-2 pt Blazer 2L or 1.5-3 pt Tackle 2L (.09-.125 + .38-.5 or .38-.75 lb act) ($17.10-33.95)

Postemergence. Tank-mix. Tank-mix may improve control of a limited number of weeds; Scepter provides residual control. Use the high Scepter rate for sunflower, smartweed, or ragweed. Blazer or Tackle rates same as for use alone. Use non-ionic surfactant at 2 pt/100 gallons of solution or crop oil concentrate according to label (usually 1 qt/A). Treat before weeds exceed 2 inches.

Command + Sencor or Lexone (CLOMAZONE + METRIBUZIN) ($17.70-27.10)

1.5-2 pt Command 4L + .25-.5 lb Sencor or Lexone 75DF or .38-.75 pt Sencor or Lexone 4L

INCORPORATED. Tank-mix. Combination has improved pigweed control when compared to Command alone. Rates of 2 pt Command + Sencor or Lexone at .38 lb of 75DF or .5 pt of 4L formulation per acre have given excellent results in SDSU tests. Apply as for Command alone. Follow precautions for each product.

Command + Treflan or Sonalan + Sencor or Lexone ($14.35-32.80)

(CLOMAZONE + TRIFLURALIN OR ETHALFLURALIN + METRIBUZIN)

Command + Salute
Commence + Sencor or Lexone ($14.95-35.64)

.75-1.5 pt Command 4L + 1-2 pt Treflan 4L or 1.25-3 pt Sonalan 3L + .33-1 pt Sencor or Lexone 4L or .25-.66 lb Sencor or Lexone 75DF

.5-.75 pt Command 4L + 1.5-3 pt Salute 4E

1.5-2.66 pt Commence 5.25L + .5-.75 pt Sencor or Lexone 4L or .25-.5 lb Sencor or Lexone 75DF

PREPLANT INCORPORATED. Three-way tank-mix or use commercial premix products plus an additional product to produce the three-way combination. Salute 4L at 2.5 pt/A is equivalent to 1.5 pt Treflan + .75 pt Sencor 4L. Command is added to this premix to improve velvetleaf control. Commence 5.25E at 2 pt/A is equivalent to 1.5 pt Treflan + 1.1 pt Command 4L. Sencor or Lexone added to this premix provides additional broadleaf control in the combination. The three-way combinations allow lower rates of each component. Two-way combinations are adequate for most situations. Apply as for Command alone. Follow precautions for each product.

Command + Dual or Lasso or Prowl + Sencor ($21.95-36.30)

(CLOMAZONE + METOLACHLOR OR ALACHLOR OR PENDIMETHALIN + METRIBUZIN) ($19.40-36.75)

Command + Turbo ($15.70-27.75)

.5-.75 pt Command 4L + 1.25-2.5 pt Dual 8L or 2-3 qt Lasso 4L or 4MT or 1.5-2.5 pt Prowl 4L + .5-1 pt Sencor 4L or .38-.75 lb Sencor 75DF

.5-.75 pt Command 4L + 1.5-2.75 pt Turbo 8L

SHALLOW PREPLANT INCORPORATED. Three-way tank-mix or use Turbo premix containing 6.55 lb metolachlor (Dual) + 1.45 lb metribuzin (Sencor) per gallon. Rate of 2.5 pt is approximately equivalent to 2 pt Dual 8L + .9 pt Sencor 4L. Shallow incorporate as for Dual, Lasso, or Prowl alone. Preemergence application not included because of preplant incorporated use for Command. Will improve consistency of grass and pigweed control. May have limited advantage over two-way tank-mixes for most fields. Allows for some reduced rates of each product. Follow precautions listed for each product alone.

Vernam or Reward + Treflan or Prowl or Amiben (VERNOLATE or VERNOLATE + EXTENDER + TRIFLURALIN or PENDIMETHALIN or CHLORAMBEN)

Vernam + Sonalan (VERNOLATE + ETHALFLURALIN)

2.33-3.5 pt Vernam 7L or 2.66-4 pt Reward 6L + 1-1.5 pt Treflan 4L ($10.85-16.30)

1.75-3 pt Vernam 7L or 2-3.5 pt Reward 6L + .75-1.5 pt Prowl 4L ($8.05-14.60)

2.33 pt Vernam 7L or 2.66 pt Reward 6L + 3 qt Amiben 1.8L or 1.75 lb Amiben 75DS ($19.80)

2.33-3 pt Vernam 7L + 1.25-3.5 pt Sonalan 3L ($11.45-21.00)

PREPLANT INCORPORATED. Tank-mix. Incorporate as for Vernam or Reward alone. Both herbicides in the combination are primarily for annual grass control except for Vernam or Reward + Amiben. Deep incorporation of Amiben reduces control of small-seeded annual broadleaves except under very dry conditions. Fair to good velvetleaf control with Vernam or Reward + Amiben. Treatments appear to have limited potential compared to other alternatives available. Greatest potential is for situations requiring grass control greater than expected from each herbicide alone. Refer to sections for each herbicide alone.

Vernam or Reward and Amiben or Lorox (VERNOLATE or VERNOLATE + EXTENDER and CHLORAMBEN or LINURON)

($23.90-35.90)

1.75-3 pt Vernam 7L or 2.66-4 pt Reward 6L and 4-6 qt Amiben 1.8L or 2.4-3.6 lb Amiben 75DS

1.75-3 pt Vernam 7L or 2.66-4 pt Reward 6L and 1-2.5 lb Lorox 50DF ($14.55-28.95)

SPLIT PREPLANT INCORPORATED AND PREEMERGENCE. Incorporate the recommended rate of Vernam or Reward as for Vernam or Reward alone. Apply Amiben or Lorox preemergence. Good to very good control of several small-seeded annual broadleaves. Less consistent grass control. Vernam or Reward gives somewhat better velvetleaf control than other preplant treatments. Amiben or Lorox further improves broadleaf control. Appears to be limited to situations where velvetleaf is part of a serious broadleaf problem and soil factors exclude the use of metribuzin. Refer to section for each herbicide.

Vernam or Reward + Treflan + Sencor or Lexone (VERNOLATE or VERNOLATE + EXTENDER + TRIFLURALIN + METRIBUZIN)

($17.50-24.75)

2.33-3.5 pt Vernam 7L or 2.66-4 pt Reward 6L + 1 pt Treflan 4L + .5-.75 pt Sencor or Lexone 4L

PREPLANT INCORPORATED. Three-way tank-mix. Incorporate as for Vernam or Reward alone. Provides excellent annual grass control and good to excellent control of annual broadleaves. Vernam or Reward + Sencor or Lexone has provided good to very good velvetleaf control and will usually be superior to other two-way combinations using these lower Sencor or Lexone rates. Has most potential for situations where Sencor or Lexone rates must be minimized. Some early searing can be expected. Maximum Sencor or Lexone rate is .5 pt/A with Reward. Follow soil precautions for Sencor or Lexone. Refer to section for Vernam or Reward alone.

Treflan or Prowl + Amiben + Sencor or Lexone (TRIFLURALIN or PENDIMETHALIN + CHLORAMBEN + METRIBUZIN)

1-2 pt Treflan 4L + 3-6 qt Amiben 1.8L or 1.8-3.6 lb Amiben 75DS + .5-.75 pt Sencor or Lexone 4L or .33-.5 lb Sencor or Lexone 75DF ($22.35-41.50)

1.5-2.5 pt Prowl 4L + 3-6 qt Amiben 1.8L or 1.8-3.6 lb Amiben 75DS + .5-.75 pt Sencor or Lexone 4L or .33-.5 lb Sencor or Lexone 75DF ($23.80-42.90)

Three-way combinations. These combinations are intended to improve weed control with Treflan or Prowl + Amiben combinations while minimizing the risk of injury associated with Sencor or Lexone. Provides very good to excellent control of many annual weeds; however, control of weeds such as velvetleaf or cocklebur is less than for the combinations using full Sencor or Lexone rates. Appears to have limited potential for most weed situations. Follow soil limitations as for Sencor or Lexone.

PREPLANT INCORPORATED. Tank-mix. Incorporate as for Treflan or Prowl alone.

Sonalan and/+ Dual or Lasso (ETHALFLURALIN and/+ METOLACHLOR or ALACHLOR)

1.25-3 pt Sonalan 3L and/+ 2-4 qt Lasso 4L or 4MT ($15.00-31.60)

1.25-3 pt Sonalan 3L and/+ 1.5-3 pt Dual 8L ($14.15-29.90)

Excellent annual grass control. Both herbicides are most effective on grasses. Combination useful for improved black nightshade control or for situations when grass problems are critical. Rates are essentially full rates of each used alone. Limited data on crop tolerance. Use 3 to 3.5 pt/A Sonalan for black nightshade. Potential primarily for nightshade or to improve control of difficult grass problems. Refer to section for Sonalan alone.

SHALLOW PREPLANT INCORPORATED. Tank-mix. Apply and incorporate as for Sonalan alone. Use 1 pt/A more Lasso than for preemergence. Do not incorporate herbicide over 2 inches deep.

SPLIT PREPLANT INCORPORATED AND PREEMERGENCE. Apply and incorporate usual rate of Sonalan alone. Apply Dual or Lasso preemergence. Banding at planting is convenient and reduces cost.

Prowl + Dual or Lasso (PENDIMETHALIN + METOLACHLOR or ALACHLOR)
Treflan + Dual (TRIFLURALIN + METOLACHLOR)
Treflan + Lasso (TRIFLURALIN + ALACHLOR)
Cannon

1-2.5 pt Prowl 4L + 1.5-3 pt Dual 8L ($13.35-28.30)

1-2.5 pt Prowl 4L + 2.5-4 qt Lasso 4L or 4MT ($16.95-30.00)

1-2 pt Treflan 4L + 1.5-3 pt Dual 8L ($13.50-27.05)

1 pt Treflan 4L + 2-3 qt Lasso 4L or 4MT ($14.35-19.90)

4 qt Cannon

TANK-MIX. Excellent annual grass control. Both herbicides are most effective on grasses. The combination provides little improvement for many broadleaves except black nightshade. Also improves shattercane control. Appears useful in limited potential for weed problems in most field situations unless annual grasses are critical. Cannon is a commercial premix containing 2.5 lb alachlor (Lasso) + .5 lb trifluralin per gallon. Refer to section for Prowl or Dual or Lasso alone.

SHALLOW PREPLANT INCORPORATED. Prowl combinations or Cannon. Incorporate into the top 1 to 2 inches of soil as for Prowl alone. Avoid deep incorporation. Preemergence surface application less consistent.

PREPLANT INCORPORATED. Treflan combination. Incorporate into the top 2 to 3 inches of soil as for Treflan alone. Deep incorporation reduces effectiveness of Dual or Lasso.

Lorox or Linuron (LINURON) ($7.10-35.40)

1-5 lb Lorox or Linuron 50DF or 1-5 pt Lorox or Linex 4L

PREEMERGENCE. Most useful in preemergence combinations to improve broadleaf control. Note safety and handling precautions. Minimum carrier is 20 gpa for ground equipment. Not suggested for use alone. Linuron (active ingredient in Lorox) now is available in other tradename products such as Linuron or Linex.

Sencor or Lexone (METRIBUZIN) ($6.65-13.35)

.5-1 pt Sencor or Lexone 4L or .33-.66 lb Sencor or Lexone 75DF

Most useful in preplant or preemergence combinations to improve broadleaf control. Not suggested for use alone.

Surflan (ORYZALIN) ($15.00-30.00)

1-2 lb Surflan 75W or .75-1.5 qt Surflan 4AS

PREEMERGENCE. Chemically related to Treflan but does not require incorporation. Weed control has been less satisfactory than for Treflan. May be applied in fall or in spring directly to undisturbed stubble for no-till soybeans. Potential for use alone or in combination with other herbicides in reduced tillage systems will continue to be evaluated. May be tank-mixed at .5 to 1.25 qt/A with Lorox, Sencor, Lexone, Goal, or Amiben. May be applied in liquid fertilizer carrier.

Lasso or Dual + Amiben + Sencor or Lexone
(ALACHLOR or METOLACHLOR + CHLORAMBEN + METRIBUZIN)

2-3 qt Lasso 4L or 4MT + 4-6 qt Amiben 1.8L or 2.4-3.6 lb Amiben 75DS +
.5-1 pt Sencor or Lexone 4L or .33-.66 lb Sencor or Lexone 75DF ($34.10-54.50)
1.5-3 pt Dual 8L + 4-6 qt Amiben 1.8L or 2.4-3.6 lb Amiben 75DS +
.5-1 pt Sencor or Lexone 4L or .33-.66 lb Sencor or Lexone 75DF ($33.25-58.30)

Three-way tank-mix. Intended to improve control of certain weeds which are not controlled by Lasso or Dual + Amiben combination while reducing the risk of injury associated with Sencor or Lexone. Provides very good to excellent control of many annual weeds; however, control of weeds such as velvetleaf or cocklebur is less than for the combinations using full Sencor or Lexone rate. Appears to have limited potential for most weed situations. Follow soil limitations as for Sencor or Lexone.

SHALLOW PREPLANT INCORPORATED. Incorporate as for Lasso or Dual alone.

PREEMERGENCE. As for Lasso or Dual alone. Do not apply after crop emerges. Rainfall required.

Lasso or Dual + Lorox + Lexone (ALACHLOR or METOLACHLOR + LINURON + METRIBUZIN)

($10.95-44.00)

1-3 qt Lasso 4L or 4MT + .33-2 pt Lorox 4L + .25-1 pt Lexone 4L or .25-.66 lb Lexone 75DF
1-2.5 pt Dual 8L + .33-2 pt Lorox 4L + .25-1 pt Lexone 4L or .25-.66 lb Lexone 75DF

($12.25-44.45)

Three-way tank-mix. Intended to improve control of annual broadleaves while limiting the rate of Lexone, especially on marginal soils. Excellent general broadleaf control. Performance on velvetleaf primarily dependent on Lexone rate. If rates are reduced to lessen risk of injury, velvetleaf control diminishes. Rate of 1.5 pt Lorox + Lexone at .66 pt 4L or .5 lb 75DF with usual rate of Dual or Lasso suggested for most soils. There is considerable risk of injury from the combined effect of Lorox and Lexone if full rates listed for each are used. Do not use on light, sandy soil or soil with a pH over 7.5. Linuron (active ingredient in Lorox) now is available in other tradename products such as Linuron or Linex.

PREEMERGENCE. Apply as soon as possible after planting. Do not incorporate or apply after crop emergence.

Amiben + Sencor or Lexone or Lorox (CHLORAMBEN + METRIBUZIN or LINURON)

($17.00-39.75)

3-4.5 qt Amiben 1.8L or 1.8-2.7 lb Amiben 75DS + .66-3 lb Lorox 50DF or 1-3 pt Lorox 4L
3-4.5 qt Amiben 1.8L or 1.8-2.7 lb Amiben 75DS + .5-1 pt Sencor or Lexone 4L or .33-.66 lb Sencor or Lexone 75DF ($19.00-31.85)

PREEMERGENCE. Tank-mix. Limited data. More effective on annual broadleaves than annual grasses. Adjust rates for soil type. Will allow for reduced rates of metribuzin for small-seeded weeds like Russian thistle, however velvetleaf and sunflower control will not be maintained. May be applied in liquid fertilizer. Refer to section for Amiben, or sections for Lorox, Sencor, or Lexone combinations. Linuron (active ingredient in Lorox) now is available in other tradename products such as Linuron or Linex.

Blazer or Tackle + Butyrac 200 or Butoxone (ACIFLUORFEN + 2,4-DB) ($9.95-13.10)

1.5-2 pt Blazer 2L + 2 oz Butyrac 200 or Butoxone 2L
2 pt Tackle 2L + 2-3 oz Butyrac 200

POSTEMERGENCE. Tank-mix. Primarily for use in special situations where weeds exceed the maximum height for Blazer or Tackle. The addition of 2,4-DB provides some improved control of cocklebur, ragweed, and pigweed up to 12 inches tall. Considerable soybean leaf and stem twisting and some yellowing can be expected. Some differential varietal tolerance to 2,4-DB has been reported. Do not add oil or surfactant. Do not treat plants under stress. Use maximum recommended rate of Blazer or Tackle and 2 fl oz of Butyrac 200 or Butoxone per acre. Appears to have very limited potential for most field situations. Refer to Blazer or Tackle section.

Basagran + Butyrac 200 (BENTAZON + 2,4-DB) ($10.45-13.80)

1.5-2 pt Basagran 4L + .12 pt Butyrac 200

POSTEMERGENCE. Tank-mix. Primarily for improved control of annual morning glory, which escapes Basagran. Thorough coverage and early application required, for Basagran increases risk of injury from 2,4-DB portion. Corsoy, Amcor, and SRF 250 are reported to be more sensitive to 2,4-DB. Do not treat plants under stress. Do not add oil or surfactant. Appears to have very limited potential for most field situations. Refer to Basagran alone.

Rescue
Alanap L + Butyrac 200 or Butoxone (NAPTALAM + 2,4-DB)

($7.80-11.70)

2-3 qt Rescue 2L
2-3 qt Alanap 2L + 3-4 fl oz Butyrac 200 or Butoxone 2L

POSTEMERGENCE. Tank-mix. Or use commercial premix (Rescue) containing 2 lb Alanap L and .06 lb of 2,4-DB active per gallon. Primarily intended as a "rescue" treatment to control broadleaved annual weeds that cannot be controlled with other postemergence treatments. Most effective on cocklebur, sunflower, and marshelder. Control has been somewhat variable; however, weed growth and seed production have been reduced considerably when applied at proper stage. Cocklebur should be 10 to 36 inches or until early bloom; sunflower 12 inches through early bud, and marshelder 12 inches through pollination. Activity is reduced if applied during hot, dry conditions. Maximum effects on weeds usually apparent in 3 weeks. Rate of 2 to 3 qt/A of Rescue is equivalent to the tank-mix of 2-3 qt Alanap L + 3 to 4 fl oz of Butoxone or Butyrac 200 per acre. Use high rate for weeds over 10 to 12 inches tall. Add non-ionic surfactant or crop oil concentrate at 2 qt/100 gal solution. Apply after first bloom to midbloom. Leaf abnormalities or stunting may be increased with earlier application. Corsoy, Amcor, and SRF 250 are reported to be more sensitive to 2,4-DB. Spray boom should be 18 to 24 inches above weeds or crop. Minimum carrier is 10 gpa for ground or 5 gpa for air. Use 40 to 50 psi pressure to provide a fine spray with hollow cone nozzles. Do not apply within 60 days of harvest.

SPOT SPRAYING. Use a 7.5% Rescue solution (1.5 gal Rescue in 20 gal water plus surfactant). Results on cocklebur or sunflower have been good. Use handgun with flat fan or hollow cone tip.

Rescue + Blazer ($14.10-21.30)

2-3 qt Rescue 2L + 1-1.5 pt Blazer 2L

Tank-mix. Blazer improves control of larger weeds; especially pigweed and ragweed. Do not apply prior to crop bloom stage. Use a non-ionic surfactant or crop oil concentrate additive. Fertilizer solutions (10-34-0) may be used at 1 qt/A.

NO-TILL HERBICIDES

The treatments below include herbicides or uses that specifically fit no-till systems. Preemergence and postemergence herbicides described previously are also used in no-till.

Bronco (ALACHLOR + GLYPHOSATE)

3.25-5 qt Bronco 4L

Commercial premix containing 2.6 lb alachlor (Lasso) + 1.04 lb glyphosate (Roundup) acid equiv per gallon. Intended to control emerged weeds in no-till situations. Excellent control of emerged annual grasses. Perennials may be suppressed. Lasso provides residual annual grass control, but is dependent upon rainfall before weeds emerge. Bronco can be tank-mixed with Lorox, Lexone, or Sencor for improved annual broadleaf control. Do not apply after crop emergence. Minimum carrier is 10 gpa water or liquid nitrogen fertilizer.

Dual (METOLACHLOR) ($16.95-20.35)

2.5-3 pt Dual 8L

Intended to provide initial control of early season weeds and residual control into the season. Rainfall required. Does not control emerged weeds. Primarily for annual grasses. Weed control has been acceptable except in seasons with heavy, early rainfall that delays planting and the overlay application. Add paraquat or Roundup if weeds emerged at application. Refer to section for Dual alone for application directions. Plant with no-till equipment to minimize soil disturbance.

Dual or Lasso + Sencor or Lexone (METOLACHLOR or ALACHLOR + METRIBUZIN) Turbo

($23.70-47.00)

2-3 pt Dual 8L + .75-2 pt Sencor or Lexone 4L or .5-1.3 lb Sencor or Lexone 75DF
3-4 qt Lasso 4L or 4MT + .75-2 pt Sencor or Lexone 4L or .5-1.3 lb Sencor or Lexone 75DF
1.5-3.75 pt Turbo 8E ($26.66-48.70)

Intended for initial control in early season and for extended control into the season. Rainfall required. Add Roundup or paraquat if weeds exceed one inch at application. Controls annual grasses and several annual broadleaves. Promising program for no-till. Weed control has been good to excellent, except in seasons with heavy early rainfall that delays planting and the overlay application. Dual preferred for situations requiring maximum interval before planting. Do not use on sandy soil. Use lower rate on soils having a calcareous surface layer or a pH over 7.5. Refer to section for Dual or Sencor or Lexone alone. Plant with no-till equipment to minimize soil disturbance. The addition of 2,4-D ester to the mixture applied at least 30 days before planting will improve control of larger emerged broadleaf weeds.

EARLY PREPLANT SURFACE. Apply 15-30 days before planting. Split application. Apply approximately 2/3 of the total amount early and the remaining 1/3 as an overlay at planting.

Lorox Plus (LINURON + CHLORIMURON-ETHYL)

12-18 oz Lorox Plus 60DF

EARLY PREPLANT. May be applied up to 30 days before planting on soils with a pH of 6.8 or less. Surfactant or crop oil concentrate at 1 qt/100 gallons of solution can be added for burndown. Larger emerged weeds can be controlled with the addition of Roundup, paraquat, or Bronco. Tank-mix can include 2,4-D ester if applied at least 30 days before planting. Refer to section for Lorox Plus.

Preview (METRIBUZIN + CHLORIMURON-ETHYL)

6-10 oz Preview 75DF

EARLY PREPLANT. May be applied up to 30 days before planting. Add surfactant or crop oil concentrate at 1 qt/100 gallons carrier to provide burndown of small weeds. Preview can also be applied with Roundup, paraquat, or Bronco for burndown of larger weeds. It can also be mixed with 2,4-D ester if applied at least 30 days before planting. Refer to section for Preview for additional details. Maximum soil pH is 6.8.

Roundup (GLYPHOSATE)

($4.80-76.50)

.5 pt-4 qt Roundup-3L

Roundup is a non-selective, translocated, foliage applied herbicide used in no-till or reduced tillage systems, as a spot treatment for perennials, or in specialized application equipment. There is no soil residual. All emerged vegetation coming in contact with the herbicide will be damaged or killed.

The low rate, low carrier volume applications are in 3 to 10 gpa for ground or 3 to 5 gpa for air. Weeds should be growing actively. Hard water reduces control, especially at high carrier rates. Add surfactant at 2 to 4 qt/100 gal solution. The addition of ammonium sulfate at 17 lb/100 gal frequently improves control when using hard water or higher carrier volumes.

ROUNDUP. Rate for perennials is 2 to 4 qt/A. Perennial weeds usually do not have sufficient growth to treat in spring before planting.

Rate for most annuals for Roundup alone is 8 to 12 fl oz (.5-.75 pt). Use 8 fl oz for foxtail; 12 fl oz for barnyardgrass, downy brome in cultivated fields, and mustard; 16 fl oz for pennycress, shepherds purse, lambsquarters, wild oat, witchgrass, and downy brome in no-till systems. Maximum weed size varies from 6 to 18 inches. Labeled rates provide more consistent control than lower amounts.

NO-TILL or REDUCED TILLAGE SYSTEMS. Roundup may replace one tillage to control emerged weeds. It is used in combination with preemergence herbicides to provide residual weed control. Use lower rate for annual weeds under 6 inches tall and high rate for taller annuals. Minimum carrier is 5 gpa water. Several combination treatments are listed (Liquid formulations are listed; however, an equivalent amount of other formulations may be used):

1-1.5 qt Roundup + 2-3 qt Lasso + 1-3 pt Lorox
1-1.5 qt Roundup + 1.5-2.5 pt Dual + 1-3 pt Lorox
1-1.5 qt Roundup + 2-3 qt Lasso + .5-1 pt Sencor or Lexone
1-1.5 qt Roundup + 1.5-2.5 pt Dual + .5-1 pt Sencor or Lexone
1-1.5 qt Roundup + .5-1.25 qt Surflan + .5-1 pt Sencor or Lexone
1-1.5 qt Roundup + .5-1.25 qt Surflan + 1-2 pt Lorox
1-1.5 qt Roundup + 2-2.5 qt Lasso + 4 qt Amiben
1-1.5 qt Roundup + 2-2.5 pt Dual + 4-6 qt Amiben
1-1.5 qt Roundup + 1-2.5 pt Prowl + 1-2.5 pt Lorox
1-1.5 qt Roundup + 1-2.5 pt Prowl + .75-1 pt Sencor or Lexone

Gramoxone Super (PARAQUAT) ($7.20-24.00)

1.5-5 pt Gramoxone Super 1.5L

NO-TILL or REDUCED TILLAGE SYSTEMS. Paraquat is a non-selective, non-residual, contact herbicide which can be used to control emerged weeds at planting. It is used in combination with preemergence herbicides for residual control. Rates of 1.5 to 2.5 pt/A Gramoxone Super are adequate for small weeds; the high rate is for larger weeds or dense stands. Add 1 to 2 pt X-77 spreader per 100 gal of solution. Minimum carrier is 20 gpa for ground or 5 gpa for air. Thorough coverage is very important. Refer to harvest aid section for precautions. Several combinations labeled for use with paraquat are listed below.

Amount of product per acre, tank-mix (Liquid formulations are listed; however, an equivalent amount of other formulations may be used. Add X-77 at the rate of 1 to 2 pt/100 gallons of solution):

1.5-2.5 pt Gramoxone Super + .75-1.75 pt Sencor or Lexone
1.5-2.5 pt Gramoxone Super + 2-2.5 qt Lasso + .5-1 pt Sencor or Lexone
1.5-2.5 pt Gramoxone Super + 1.5-2.5 pt Dual + .5-1 pt Sencor or Lexone
1.5-2.5 pt Gramoxone Super + 1-2.5 pt Prowl + 1-2.5 pt Lorox
1.5-2.5 pt Gramoxone Super + 1-2.5 pt Prowl + .75-1 pt Sencor or Lexone
1.5-2.5 pt Gramoxone Super + 1.5-2.5 pt Dual + 1-3 pt Lorox
1.5-2.5 pt Gramoxone Super + 2-3 qt Lasso + 1-3 pt Lorox
1.5-2.5 pt Gramoxone Super + 2-2.5 qt Lasso + 4 qt Amiben
1.5-2.5 pt Gramoxone Super + 1.5-2.5 pt Dual + 4-6 qt Amiben
2.5 pt Gramoxone Super + .5-1.25 qt Surflan + .5-1 pt Sencor or Lexone
2.5 pt Gramoxone Super + .5-1.25 qt Surflan + 1-2 pt Lorox

Poast + 2,4-D ester ($7.75)

.5 pt Poast 1.5L + 1 pt 2,4-D - 3.8E

Tank-mix. Aids control of emerged broadleaves. Add 2 pt/A crop oil concentrate. Follow application directions as for Poast alone.

EARLY PREPLANT. Apply at least 30 days before planting.

WEED RESPONSE TO HERBICIDES

WEED RESPONSE

Weed control percentages are intended as a guide for comparing alternatives. Percentages are estimated based on favorable conditions.

E = Excellent.	90-95%	Usually over 90% Seldom 100%.	Best choice for weed.
G= Good.	80-90%	Sometimes under 80% Seldom over 90%.	Usually satisfactory.
F = Fair.	65-80%	Sometimes under 65% Seldom over 80%.	Sometimes unsatisfactory. Moderate infestation.
M= Marginal.	40-65%	Seldom over 65% Erratic.	Seldom satisfactory. Light infestations only.
P = Poor.		Usually under 40% or no control.	Not recommended.

CROP RESPONSE

Crop response is based on visual symptoms. Early season symptoms do not necessarily cause yield losses.

N = none; VS = very slight; S = slight; M = moderate; H = high
\+ = usually high part of range

		Weed Response									Crop Response
HERBICIDE TREATMENT		Foxtail	Small-Seeded Annual Broadleaves	Pigweed	Kochia	Mustard	Black Nightshade	Velvetleaf	Cocklebur	Sunflower	Crop Injury
Treflan	ppi	E	F+	G	F+	P	P	P	P	P	VS
Prowl	ppi	E	F+	G	F+	P	P	P	P	P	VS
Sonalan	ppi	E	F+	G	F+	P	M	P	P	P	S
Vernam or Reward	ppi	F+	F	G	M	P	P	F+	P	P	N
Sonalan or Prowl or Treflan/Sencor or Lexone	ppi	E	G+	E	G+	G+	P	G	F	F+	N
	pre	E	E	E	E	E	P	G+	F+	F+	N
	split	E	E	E	E	E	P	E	G	G	N+
Prowl or Treflan/Lorox	split	E	G	G	G+	G	M	F+	M	M	S+
Sonalan/Treflan or Prowl/Amiben	ppi	E	G	G+	G	F	F	M+	P	P	VS+
	split	E	G	G+	G	M+	F+	F	P	P	VS+
Command	ppi	F+	G+	F	G	G	F	E	F	M	VS
Command/Sencor or Lexone	ppi	G	E	E	E	E	F	E	G	F	M+
Command/Treflan or Sonalan	ppi	E	G+	G+	G+	G	F	G+	M	P	VS
Amiben	ppi	F	F+	G	F	F+	F+	M+	P	P	S+
	pre	F+	G	G	F+	F	F	F+	P	P	S
Lasso	ppi	G+	M	F	P	P	G	P	P	P	VS
	pre	E	M	F	P	P	G	P	P	P	VS
Dual	ppi	G+	M	F	P	P	G	P	P	P	VS
	pre	E	M	F	P	P	G	P	P	P	VS
Dual or Lasso/Amiben	ppi	G+	F+	G	F	M+	G	M+	P	P	VS+
	pre	E	G	G	F+	F	G	F	P	P	VS+
Dual or Lasso/Lorox	pre	G+	G	G	G	G	G	F+	M	M	S+
Dual or Lasso/Sencor or Lexone	ppi	G+	G+	E	E	E	F+	G	F	F	M+
	pre	E	E	E	E	E	F+	G+	F+	F+	N
Basagran	post	P	N	M	P	G	G	G+	G+	G	VS
Blazer or Tackle	post	M	G	E	F+	E	F+	M	M+	P	M+
Blazer or Tackle/Basagran	post	M	G+	E	F	E	G	G	G	G	M
Classic	post	P	G+	E	G+	E	P	G	E	E	VS
Cobra	post	M	G	E	G	E	G	F	G	G	M+
Poast	post	E	P	P	P	P	P	P	P	P	N
Fusilade	post	G	P	P	P	P	P	P	P	P	N
Whip/Option	post	E	P	P	P	P	P	P	P	P	N
Assure	post	E	P	P	P	P	P	P	P	P	N
Treflan/Lasso or Dual	split	E	F+	G	F+	M	G+	P	P	P	S
Scepter+Prowl/Treflan	ppi	E	E	E	E	E	G	G	G	E	S
Dual/Lasso+Scepter	ppi	G+	E	E	E	E	G+	G	G	E	S
	pre	E	E	E	E	E	G+	G	G	E	S
Preview	ppi	P	E	E	E	E	M	G+	E	G	S+
Lorox Plus	ppi	P	E	E	E	E	M+	G	G+	G	S

SAFETY FIRST

Follow the Label. It is a violation of federal pesticide laws to use an herbicide in manner inconsistent with its labeling. Read the entire label before using.

Applicator Safety. The most serious risk of exposure from chemicals is during handling and mixing operations with the concentrated product. Use protective equipment specified on the label. Chemical resistant gloves, eye shield, long sleeved clothing, rubber boots, and appropriate respirator should be used as required. In case of emergency, contact the Poison Control Center via 24 hour phone line:

McKennen Hospital, Sioux Falls, SD 1-800-952-0123
Dakota Midland Hospital, Aberdeen, SD 1-800-592-1889
Rapid City Regional Hospital, Rapid City, SD (605) 341-3333

Water Protection. Water quality is a public concern. Preventing spills and accidents during handling and mixing reduces risk of groundwater and surface water contamination. Mix herbicides away from wells and water sources. Prevent back siphoning into wells. Install anti-backflow devices in irrigation equipment used for pesticides. Triple rinse containers. Store herbicides properly. Identify high risk areas such as coarse soils or areas where the water table is near the surface. Be aware of herbicide properties that increase the risk of contamination in the critical areas.